# FRESHWATER SHRIMPS OF THE COLOMBIAN TRIBUTARIES OF THE AMAZON AND ORINOCO RIVERS (PALAEMONIDAE, EURYRHYNCHIDAE, SERGESTIDAE)

## Camarones de agua dulce de los afluentes colombianos de los ríos Amazonas y Orinoco (Palaemonidae, Euryrhynchidae, Sergestidae)

**Diego M. Valencia**
*Universidad de Bogotá Jorge Tadeo Lozano. diego.valencia@utadeo.edu.co*

**Martha R. Campos**
*Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Apartado 7495, Bogotá, D. C., Colombia. mhrochad@unal.edu.co*

**ABSTRACT**
A review of freshwater shrimps belonging to the genera *Palaemonetes, Pseudopalaemon, Euryrhynchus* and *Acetes* of the Colombian tributaries of the Amazon and Orinoco Rivers is presented. The species found in this work are recorded for the first time for Colombia: *Palaemonetes ivonicus* Holthuis, 1950, *Palaemonetes mercedae* Pereira, 1986, *Pseudopalaemon amazonensis* Ramos-Porto, 1979, *Pseudopalemon chryseus* Kensley & Walker, 1982, *Euryrhynchus amazoniensis* Tiefenbacher, 1978 and *Acetes paraguayensis* Hansen, 1919. Diagnoses, illustrations, distributional data and a key to the families, genera and species are presented.

**Key words.** Freshwater shrimps, Palaemonidae, Euryrhynchydae, Sergestidae, Colombian tributaries of Amazon and Orinoco Rivers.

**RESUMEN**
Se presenta una revisión de los camarones de agua dulce de los géneros *Palaemonetes, Pseudopalaemon, Euryrhynchus* y *Acetes* de los afluentes de los ríos Amozonas y Orinoco de Colombia. Las especies registradas en este trabajo constituyen los primeros registros para Colombia: *Palaemonetes ivonicus* Holthuis, 1950, *Palaemonetes mercedae* Pereira, 1986, *Pseudopalaemon amazonensis* Ramos-Porto, 1979, *Pseudopalemon chryseus* Kensley & Walker, 1982, *Euryrhynchus amazoniensis* Tiefenbacher, 1978 y *Acetes paraguayensis* Hansen, 1919. Se presentan las diagnosis, las ilustraciones, los datos sobre distribución y una clave para las familias, géneros y especies.

**Palabras clave.** Camarones de agua dulce, Palaemonidae, Euryrhynchydae, Sergestidae, afluentes de los ríos Amazonas y Orinoco de Colombia.

## INTRODUCTION

The freshwater shrimps are one of the most important groups of invertebrates in decaying organic matter (Wantzen & Wagner, 2006). The shrimps also constitute a fundamental element in the aquatic ecosystem fauna, where they function as macroconsumers.

Taxonomic and distributional studies of the freshwater shrimps that are in the Amazonian and Orinoquian regions can be found in Holthuis (1952); Rodríguez (1982); Kensley & Walker (1982); Pereira (1986, 1991); López & Pereira, (1996); and García-Dávila & Magalhães (2004). However, in these river basins in Colombia, this group is very little known and the few studies available are restricted to the species of *Macrobrachium* Bate, 1868 (Holthuis, 1952; Medina & Sobrino, 1975; Campos, 1997; Valencia & Campos, 2007). According to Valencia & Campos (2007), the genus *Macrobrachium* includes approximately 200 species, 20 of them are registered for Colombia.

The present study aims to contribute to the knowledge of the freshwater shrimps of the Colombian tributaries of the Amazon and Orinoco Rivers, belonging to the genera *Palaemonetes* Heller, 1869*, Pseudopalaemon* Sollaud, 1911*, Euryrhynchus* Miers, 1877 and *Acetes* H. Milne Edwards, 1830. The study was based in material deposited in the Crustacean Collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá (ICN-MHN-CR). The abbreviations TL and CL stand for total length, and carapace length, respectively. The total length is taken from the anterior end of the rostrum to the posterior end of the telson; the carapace length is taken from the posterior margin of the orbit to the posterior margin of the carapace.

**Key to families, genera and species of the Colombian tributaries of the Amazon and Orinoco Rivers**

1. Pleura of second abdominal somite not overlaping the first one. Fourth or fifth pair of pereopods reduced or absent (**Family Sergestidae**). Rostrum shorter than proximal margin of eyestalk (Fig. 11A)..... .....*Acetes paraguayensis*

1'. Pleura of second abdominal somite overlaping the first one. The five pairs of pereopods well developed. Rostrum longer than proximal margin of eyestalk.....2

2. Upper antenular flagelum with rami enterely free. (**Family Euryrhynchidae**). Rostrum without teeth on upper and lower margin (Fig. 1A).....*Euryrhynchus amazoniensis*

2'. Upper antenular flagelum with rami joined at base. (**Family Palaemonidae**). Rostrum with teeth on upper and lower margin (Fig. 3A,B).....3

3. Hepatic spine absent; branchiostegal spine present (Genus *Palaemonetes*) (Fig. 3A,B).....4

3'. Hepatic spine present; branchiostegal spine absent (Genus *Pseudopalaemon*) (Fig. 7A).....5

4. Telson terminal margin ending in sharp midpoint, overreached by inner pair of spinules; posterior margin of telson with two setae (Fig. 3D)..... .....*Palaemonetes ivonicus*

4'. Telson terminal margin rounded, not overreached by inner pair of spinules; posterior margin of telson with numerous setae (Fig. 5B).....*Palaemonetes mercedae*

5. Rostrum sinuous, distal portion directed upwards (Fig. 7A)..... .....*Pseudopalaemon amazonensis*

5'. Rostrum straight, without distal portion directed upwards (Fig. 9A)..... .....*Pseudopalaemon chryseus*

*Suborder Pleocyemata Burkenroad, 1963*
*Infraorder Caridea Dana 1852*
*Super family Palaemonoidea Rafinesque, 1815*
Family Euryrhynchidae Holthuis, 1950
Genus *Euryrhynchus* Miers, 1877

***Euryrhynchus amazoniensis* Tiefenbacher, 1978**
Figs. 1, 2

**Material examined.** Amazonas: **Leticia**, Corregimiento La Pedrera, Izáciga stream, 120 m asl, 9 Nov 1994, leg. M. R. Campos, 2 males, 5 females, 1 ovigerous, ICN-MHN-

CR 2548; **Leticia**, Corregimiento La Pedrera, Mirití River, El Puerto, 180 m asl, 16 Nov 1994, leg. M. R. Campos, 1 male, ICN-MHN-CR 2549. Guainía: **Inírida**, Caimán creek, 70 m asl, 19 Mar 1998, leg. M. R. Campos, 1 male, 1 female, ICN-MHN-CR 2550; **Inírida**, Lombriz Lake, 75 m asl, 20 Mar 1998, leg. M. R. Campos, 1 male, ICN-MHN-CR 2551. Vichada: **Cumaribo**, Mayoragua creek, 50 m asl, 15 May 1985, leg. G. Galvis, 1 male, 1 female, ICN-MHN-CR 1735.

**Diagnosis**. Rostrum short, straight, sharp, unarmed on upper and lower margins (Fig. 1A). Second pair of pereopods different in size and pubescent; the larger second pereopod overreaching scaphocerite with entire carpus; merus 0.7 to 1.0 x carpus length, 0.7 to 1.0 x palm length, and 0.4 x chela length; carpus 0.4 to 0.6 x chela length, with a spine at inner distal border; fingers 1.0 to 1.2 x palm length, 1 to 2 teeth on proximal portion in cutting edge of each fingers (Fig. 1D). Second male pleopod with endopod shorter than exopod, with spines on mesial and postero-lateral borders (Fig. 1C). Telson with posterior margin nearly rounded, flanked by two pairs of spinules and numerous setae between them, inner pair overreaching both midpoint and external pair (Fig. 1B).

**Size.** The largest male TL 18.2 mm, CL 6.2 mm; the largest female TL 16.5, CL 5.5 mm; 1 ovigerous female was examined: TL 15.1 mm, CL 5.0 mm.

**Previous records.** Brazil (Kensley & Walker,1982; Melo, 2003); Peru (García-Dávila & Magalhães, 2004) and Venezuela (Pereira, 1991; López & Pereira, 1996, 1998).

**Distribution for Colombia.** The new records including herein, extend its range of distribution to the Caquetá, Inírida and Vichada River basins (Fig. 2).

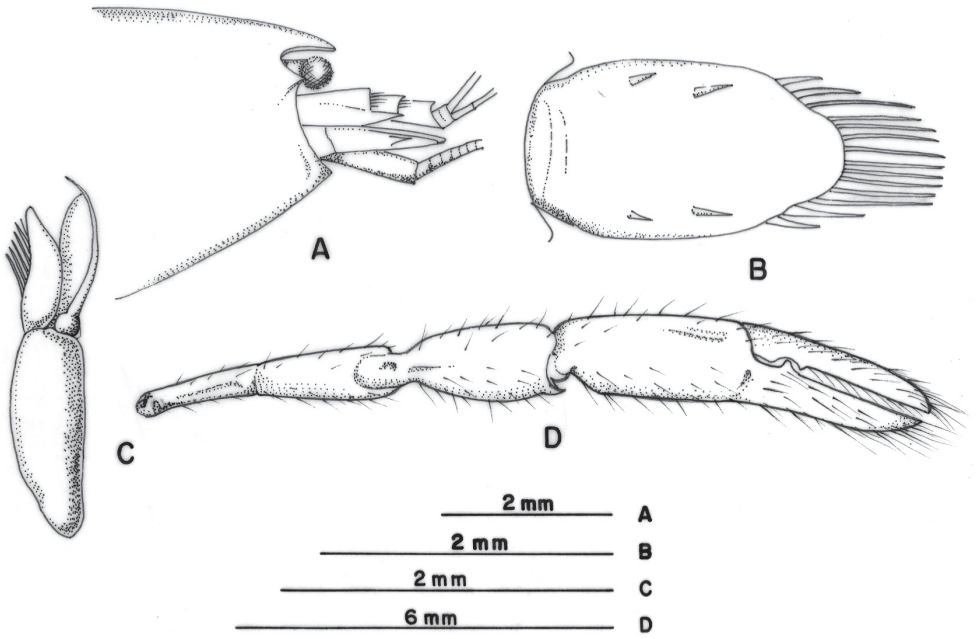


**Figure 1.** *Euryrhynchus amazoniensis* Tiefenbacher, 1978, male, ICN-MHN-CR 2549: **A**, anterior part of body, lateral view; **B**, telson, dorsal view; **C**, second male pleopod, caudal view; **D**, second pereopod, lateral view.

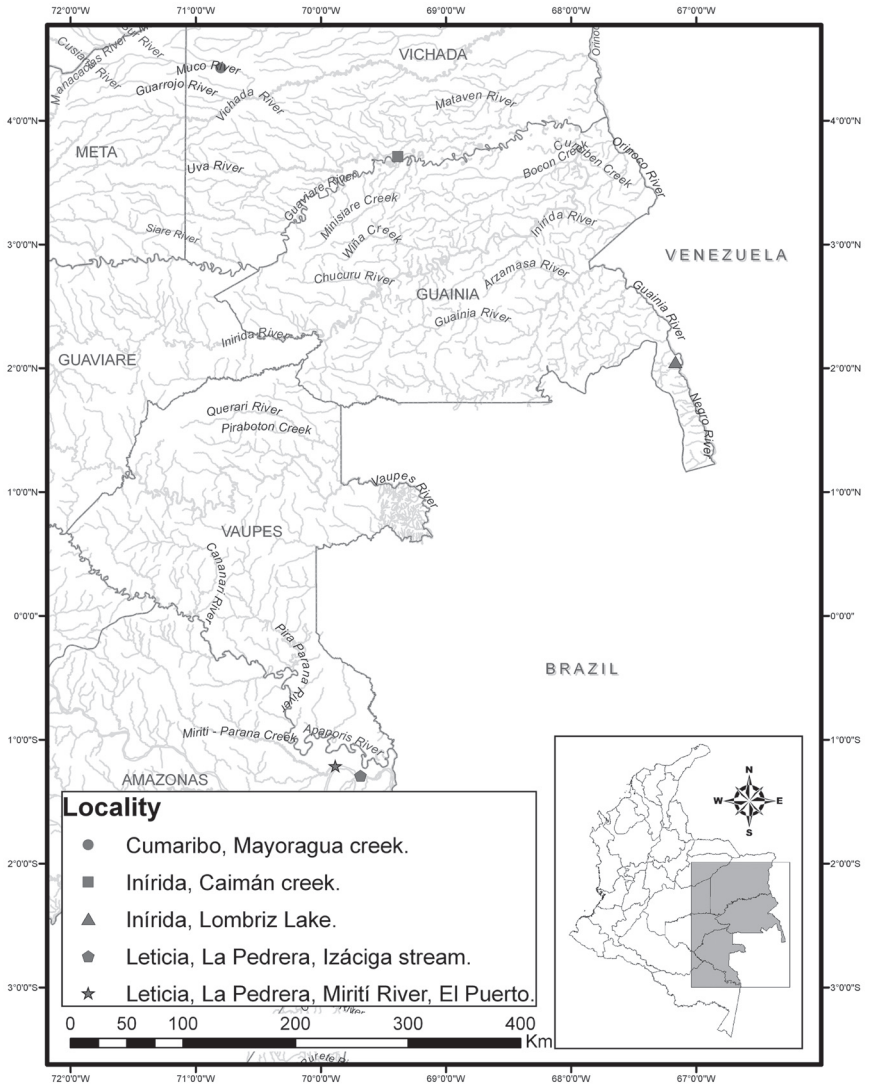


**Figure 2.** Distribution of *Euryrhynchus amazoniensis* Tiefenbacher, 1978, in Colombia.

Family Palaemonidae Rafinesque, 1815
Genus *Palaemonetes* Heller, 1869
***Palaemonetes ivonicus* Holthuis, 1950**
Figs. 3, 4

**Material examined.** Amazonas: **Leticia**, Tarapacá, 80 m asl, 20 Jan 1999, leg. G. Galvis, 3 females, 2 ovigerous, ICN-MHN-CR 2540. Arauca: **Caño Limón**, Agua Verde Lake, 125 m asl, 15 Aug 1991, leg. G. Galvis, 1 male, 3 ovigerous females, ICN-MHN-CR 2545. Casanare: **Maní**, Casimena creek, affluent of Cusiana River, 150 m asl, 25 Feb 1974, leg. P. Cala, 1 female, ICN-MHN-CR 2535; **Maní**, Casimena creek, affluent of Cusiana River, 175 m asl, 26 Feb 1971, leg. P. Cala, 1 female, ICN-MHN-CR 2538; **Orocué**, La Argentina Farm, San Miguel creek, 130 m asl, 29 May 2000, leg. A. Suárez, 1 female, ICN-MHN-CR 2534. Guainía: **Inírida**, Lombriz Lake,

75 m asl, 20 Mar 1998, leg. M. R. Campos, 1 male, 1 female, ICN-MHN-CR 1686; **Inírida**, Caimán creek, 70 m asl, 19 Mar 1998, leg. M. R. Campos, 2 females, ICN-MHN-CR 2537; **Inírida**, Agujón creek, 70 m asl, 23 Mar 1998, leg. M. R. Campos, 1 female, ICN-MHN-CR 2539. Meta: **Puerto Gaitán**, Vereda Santa Fé, Palmita creek, affluent of Muco River, 200 m asl, 17 Jul 1974, leg. P. Cala, 1 male, ICN-MHN-CR 2536. Vichada: **Cumaribo**, Carimagua Lake, 12 May 1985, leg. G. Galvis, 3 males, 21 females, ICN-MHN-CR 0668; **Cumaribo**, Mayoragua creek, 50 m asl, 15 May 1985, leg. G. Galvis, 8 males, 47 females, 1 ovigerous, ICN-MHN-CR 1736.

**Diagnosis.** Rostrum straight, as long as or slightly longer than scaphocerite; upper margin with 6 to 9 teeth, including 1 to 3 completely post orbital, lower margin 1 to 4 teeth (Fig. 3A,B). Second pair of pereopods elongated and slender, similar in shape and size, overreaching scaphocerite with 1/3 of chela to 2/3 of carpus, merus 0.5 to 0.7 x carpus length, 1.6 to 2.2 x palm length, and 0.9 to 1.2 chela length; carpus 1.6 to 2.2 x chela length; fingers 0.6 to 1.0 x palm length; fingers not gaping when closed (Fig. 3C). Telson with posterior margin ending in sharp midpoint, flanked by two pairs of spinules, inner pair overreaching midpoint and external pair, 2 feathered setae between inner pair (Fig. 3D).

**Size**. The largest male TL 25.2 mm, CL 4.9 mm; the largest female TL 34.2, CL 7.0 mm; 6 ovigerous females were examined: TL 26.1 to 32.7 mm, CL 5.4 to 6.5 mm.

**Previous records.** Brazil (Holthuis, 1966; Melo, 2003); Bolivia (Holthuis, 1952; Melo, 2003, Magalhães, 2002); Paraguay (Magalhães, 2001); Peru (García-Dávila & Magalhães, 2004); Venezuela (López & Pereira, 1996, 1998).

**Distribution for Colombia.** The new records including herein extend its range of distribution to the Amazon, Arauca, Cusiana, Inírida, Meta and Vichada River basins (Fig. 4).

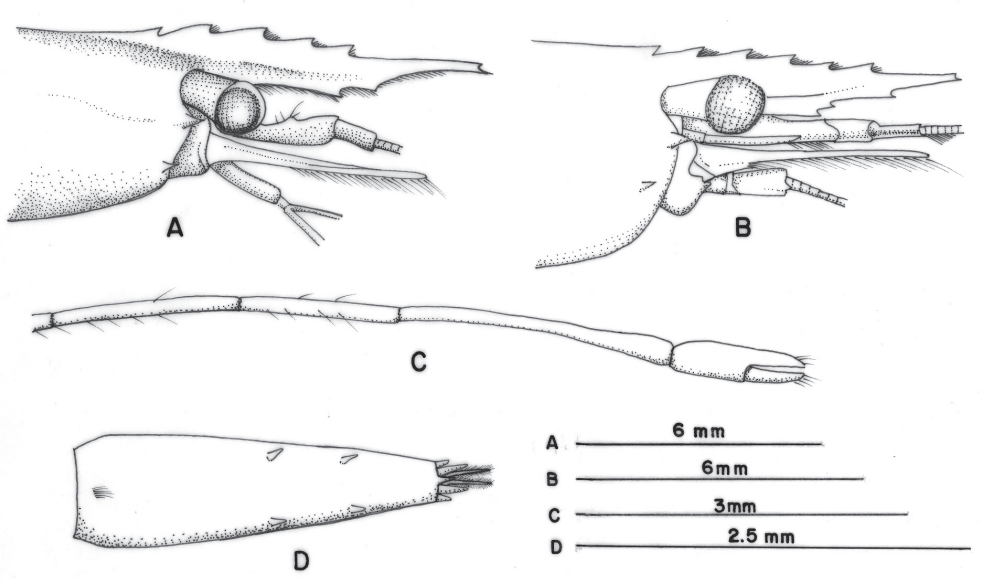


**Figure 3.** *Palaemonetes ivonicus* Holthuis, 1950, male, ICN-MHN-CR 2534: A, C, D; male, ICN-MHN-CR 1736: B. **A**, anterior part of body, lateral view; **B**, anterior part of body, lateral view; **C**, second pereopod, lateral view; **D**, telson, dorsal view.

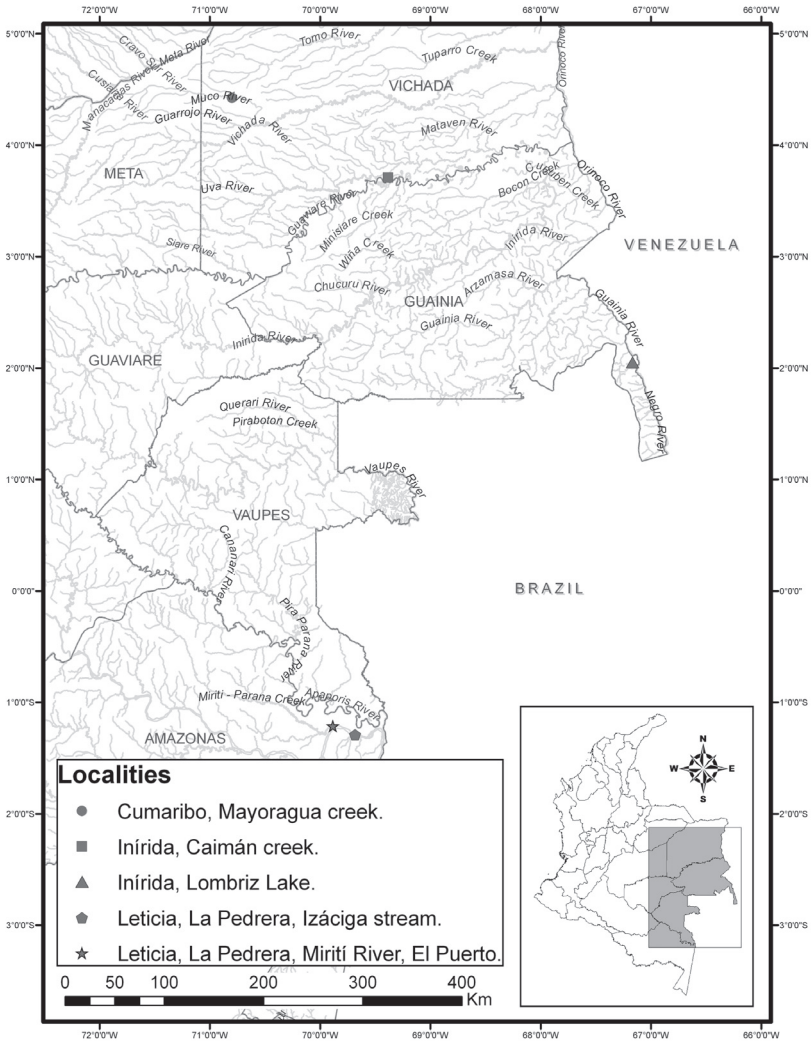


**Figure 4.** Distribution of *Palaemonetes ivonicus* Holthuis, 1950, in Colombia.

***Palaemonetes mercedae* Pereira, 1986**
Figs. 5, 6

**Material examined.** Amazonas: **Leticia**, Corregimiento La Pedrera, Izáciga stream, 120 m asl, 9 Nov 1994, leg. M. R. Campos, 1 female, ICN-MHN-CR 2544. Guainía: **Inírida**, Agujón creek, 70 m asl, 25 Mar 1998, leg. M. R. Campos, 1 female, ICN-MHN-CR 2541; **Inírida**, Caimán creek, 70 m asl, 19 Mar 1998, leg. M. R. Campos, 1 female, ICN-MHN-CR 2542; **Inírida**, Agujón creek, 70 m asl, 23 Mar 1998, leg. M. R. Campos, 3 males, 1 female, ICN-MHN-CR 2543.

**Diagnosis.** Rostrum straight, as long as scaphocerite; upper margin with 7 to 9 teeth, including 1 to 2 completely post orbital, lower margin 2 to 3 teeth (Fig. 5A). Second pair of pereopods slender, similar in shape and size, overreaching scaphocerite with 1/3 of chela to 2/3 of carpus; merus 0.7 to 0.8 x

carpus length, 1.2 to 1.4 x palm length, and 0.7 to 0.9 chela length; carpus 0.9 to 1.1 x chela length; fingers 0.6 to 0.7 x palm length (5C). Telson with posterior margin rounded, flanked by two pairs of spinules, inner pair not overreached midpoint; posterior margin of telson with numerous setae (Fig. 5B).

**Size.** The largest male TL 13.0 mm, CL 2.9 mm; 1 ovigerous female was examined: TL 16.2 mm, CL 4.1 mm.

**Previous records.** Brazil (Magalhães, 1988; Melo, 2003) and Venezuela (Pereira, 1986).

**Distribution for Colombia.** The new records including herein extend its range of distribution to the Caquetá and Inírida River basins (Fig. 6).

Genus *Pseudopalaemon* Sollaud, 1911

***Pseudopalaemon amazonensis* Ramos-Porto, 1979**

Figs. 7, 8

**Material examined.** Casanare: **Maní**, Casimena creek, affluent of Cusiana River, 150 m asl, 25 Feb 1974, leg. P. Cala, 2 males, 3 females, ICN-MHN-CR 1812; **Orocué**, La Argentina Farm, San Miguel creek, 29 May 2000, leg. A. Suárez, 1 female, ICN-MHN-CR 1878. Guainía: **Inírida**, La Ceiba Community, Seje creek, 80 m asl, 18 Mar 1998, leg. M. R. Campos, 8 males, 6 females, ICN-MHN-CR 1681; **Inírida**, Caimán creek, 70 m asl, 19 Mar 1998, leg. M. R. Campos, 1 male, 1 female, ICN-MHN-CR 1682; **Inírida**, Pajarito creek, 70 m asl, 21 Mar 1998, leg. M. R. Campos, 1 female, ICN-MHN-CR 1689; **Inírida**, Agujón creek, 70 m asl, 23,25 Mar 1998, leg. M. R. Campos, 7 males, 14 females, ICN-MHN-CR 1692, 1696; **Inírida**, Yucuta creek, 70 m asl, 24 Mar 1998, leg. M. R. Campos, 2 males, 11 females, ICN-MHN-CR 1694. Meta: **Puerto Gaitán**, Vereda Santa Fé, Palmita creek, affluent of Muco River, 200 m asl, 17 Jul 1974, leg. P. Cala, 9 females, ICN-MHN-CR 1799. Vichada: **Cumaribo**, Urimica creek, affluent of Tomo River, Centro Las Gaviotas, 160 m asl, 16, 17 Jul 1974, leg. P. Cala, 31 males, 20 females, 1 juvenile, ICN-MHN-CR 1798, 1803; **Cumaribo**, Carimagua Lake, 12 May 1985, leg. G. Galvis, 4 males, 1 female, ICN-MHN-CR 2546; **Cumaribo**, Mayoragua creek, 50 m asl, 15 May 1985, leg. G. Galvis, 3 males, 4 females, ICN-MHN-CR 2547.

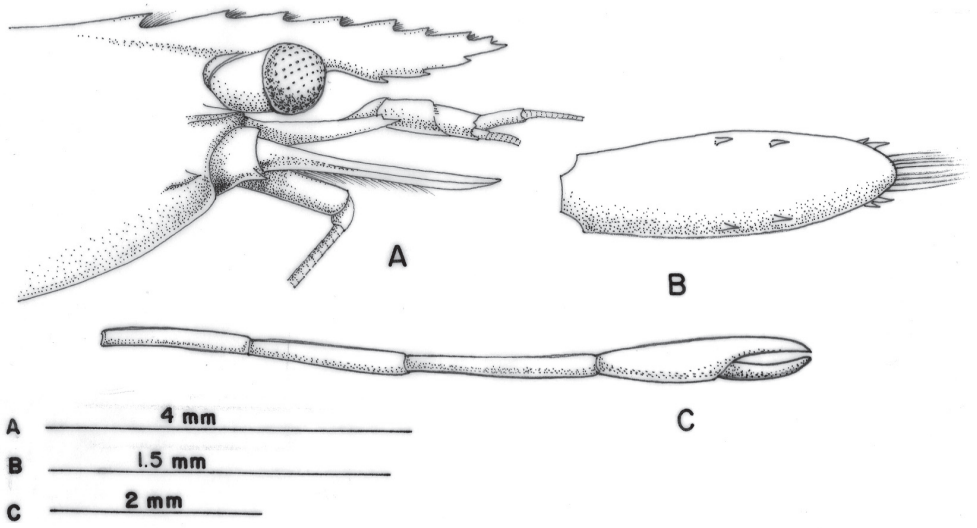


**Figure 5.** *Palaemonetes mercedae* Pereira, 1986, male, ICN-MHN-CR 2543: **A**, anterior part of body, lateral view; **B**, telson, dorsal view; **C**, second pereopod, lateral view.

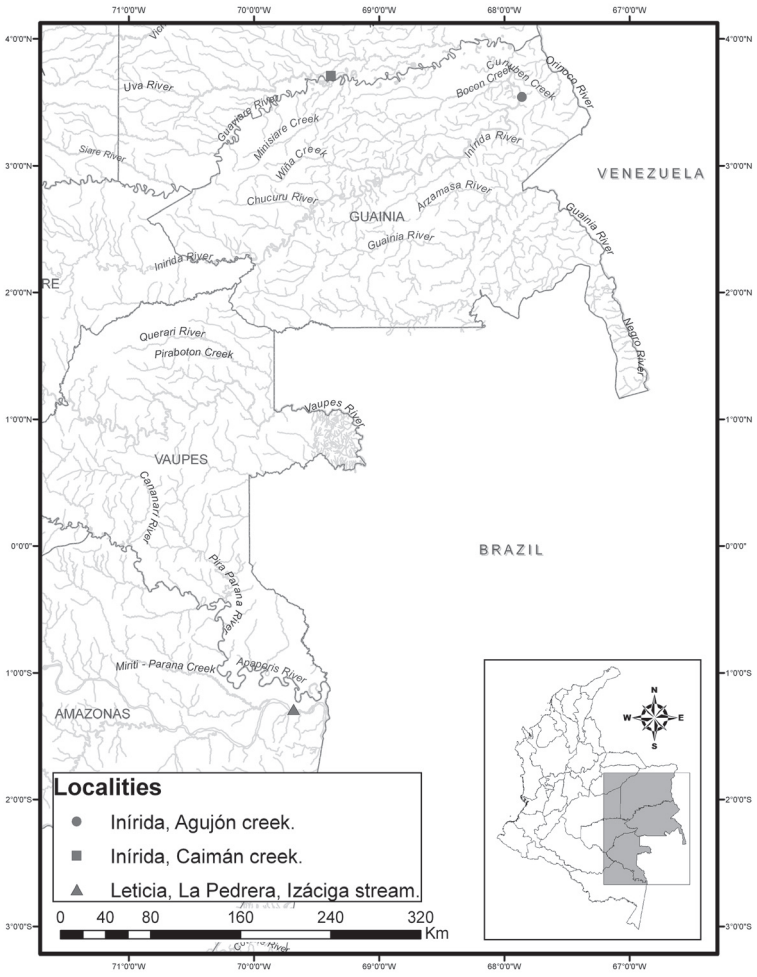


**Figure 6.** Distribution of *Palaemonetes mercedae* Pereira, 1986, in Colombia.

**Diagnosis.** Rostrum sinuous, overreaching scaphocerite, distal portion directed upwards; upper margin with 6 to 11 teeth, including 1 to 2 completely postorbital, lower margin 4 to 9 teeth (Fig. 7A). Second pair of pereopods elongated and slender, similar in shape and size, overreaching scaphocerite completely with chela to 3/4 of carpus; merus 0.6 to 0.8 x carpus length, 1.5 to 2.4 x palm length, and 0.7 to 1.0 X chela length; carpus 1.0 to 1.5 x chela length; fingers 0.8 to 2.2 x palm length; fingers not gaping when closed, cutting edges smooth (Fig. 7C). Telson with posterior margin ending in sharp midpoint, flanked by two pairs of spinules, internal pair overreaching midpoint and external pair (Fig. 7B).

**Size.** The largest male TL 38.2 mm, CL 6.2 mm; largest female TL 41.4 mm, CL 7.5 mm; 18 ovigerous females were examined: TL 31.3 to 37.7 mm, CL 6.1 to 7.7 mm.

**Previous records.** Brazil (Kensley & Walker, 1982; Melo, 2003) and Venezuela (Pereira, 1991).

**Distribution for Colombia.** The new records including herein extend its range of distribution to the Cusiana, Inírida, Meta, Tomo and Vichada River basins (Fig. 8).

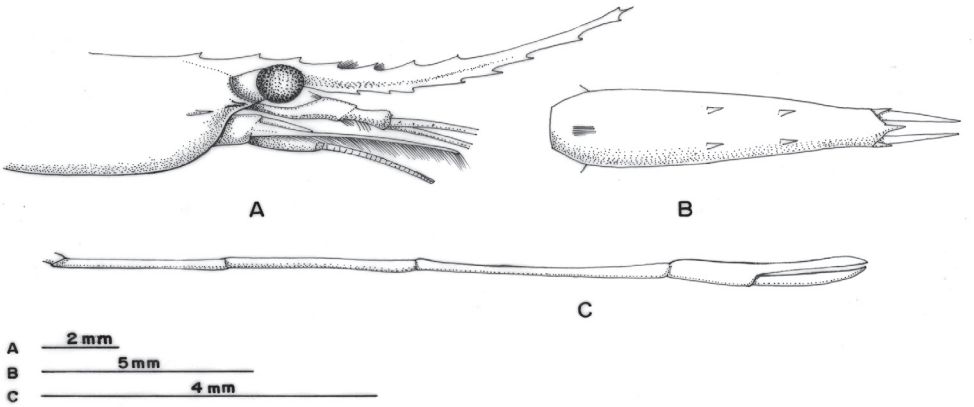


**Figure 7.** *Pseudopalaemon amazonensis* Ramos-Porto, 1979, male, ICN-MHN-CR 1681: **A**, anterior part of body, lateral view; **B**, telson, dorsal view; **C**, second pereopod, lateral view.

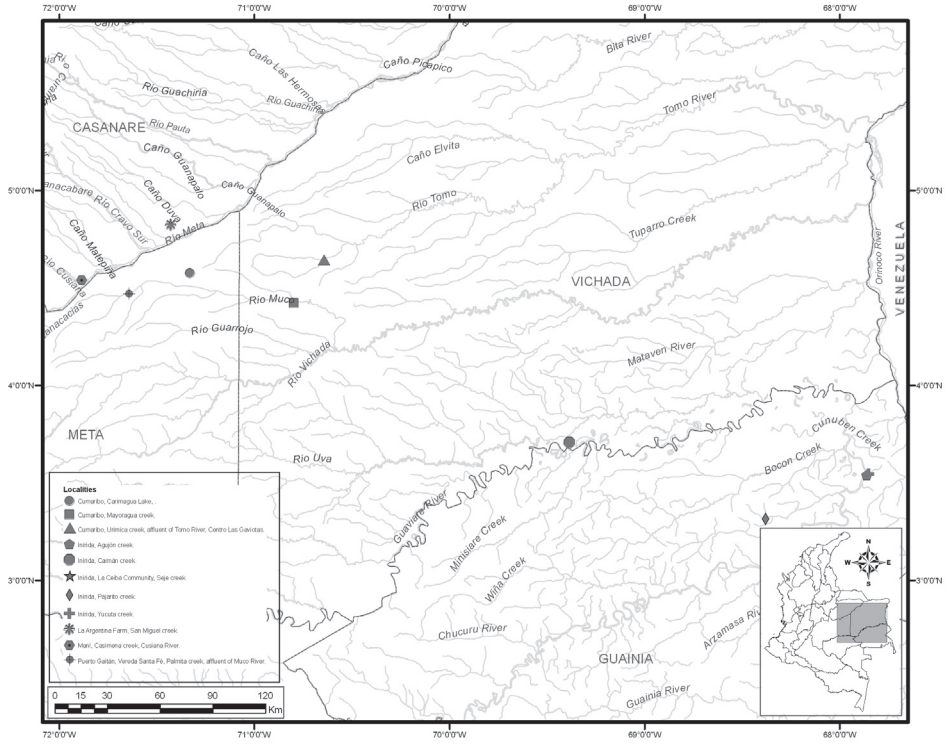


**Figure 8.** Distribution of *Pseudopalaemon amazonensis* Ramos-Porto, 1979, in Colombia.

***Pseudopalaemon chryseus* Kensley & Walker, 1982**
Figs. 9,10

**Material examined.** Casanare: **Maní**, Casimena creek, affluent of Cusiana River, 175 m, 26 Feb, 1971, leg. P. Cala, 12 hembras, ICN-MHN-CR 0029. Vichada: **Cumaribo**, Mayoragua creek, 50 m, 15 May 1985, leg. G. Galvis, 2 machos, 13 hembras, ICN-MHN-CR 2554.

**Diagnosis.** Rostrum straight, as long as or slightly longer than scaphocerite; upper

margin with 7 to 11 teeth, including 2 completely postorbital, lower margin 3 to 4 teeth (Fig. 9A). Second pair of pereopods elongated and slender, similar in shape and size, overreaching scaphocerite with 1/4 to 2/3 of carpus; merus 0.6 to 0.7 x carpus length, 1.3 to 1.6 x palm length, and 0.7 to 0.8 x chela length; carpus 1.0 to 1.1 x chela length; fingers 0.7 to 1.0 x palm length; fingers not gaping when closed (Fig. 9C). Telson with margin ending in sharp midpoint, flanked by two pairs of spinules, internal pair overreaching midpoint and external pair (Fig. 9B).

**Size.** The largest male TL 19.1 mm, CL 4.3 mm; largest female TL 22.3 mm, CL 5.7 mm.

**Previous records.** Brazil (Kensley & Walker, 1982; Melo, 2003).

**Distribution for Colombia.** The new records including herein, extend its range of distribution to the Cusiana and Vichada River basins (Fig. 10).

Suborder Dendrobranchiata Latreille, 1802.
Superfamily Sergestoidea Dana, 1852.
Family Sergestidae Dana, 1852
Genus *Acetes* H. Milne Edwards, 1830

***Acetes paraguayensis* Hansen, 1919**

Fig. 11,12

**Material examined.** Amazonas: **Leticia**, Amazon River, 80 m asl, 22 Jan 2008, leg. I. Mojica, 1 male, ICN-MHN-CR 2559.

**Diagnosis.** Rostrum shorter than proximal margin of eyestalk, with prominent dorsal tooth, and small subterminal one (Fig. 11A). Coxa of third pair of pereopods with acute spine (Fig. 11B). Telson with posterior margin rounded with numerous setae.

**Size.** Male TL 19.1 mm, CL 5.0 mm.

**Previous records.** Venezuela (Rodríguez, 1982; Melo, 2003); Bolivia (Magalhães, 2002); Peru (García-Dávila & Magalhães, 2004; Melo, 2003); Suriname (Melo, 2003), Paraguay, Argentina (Hansen, 1919; Melo, 2003), and Brazil (Melo, 2003).

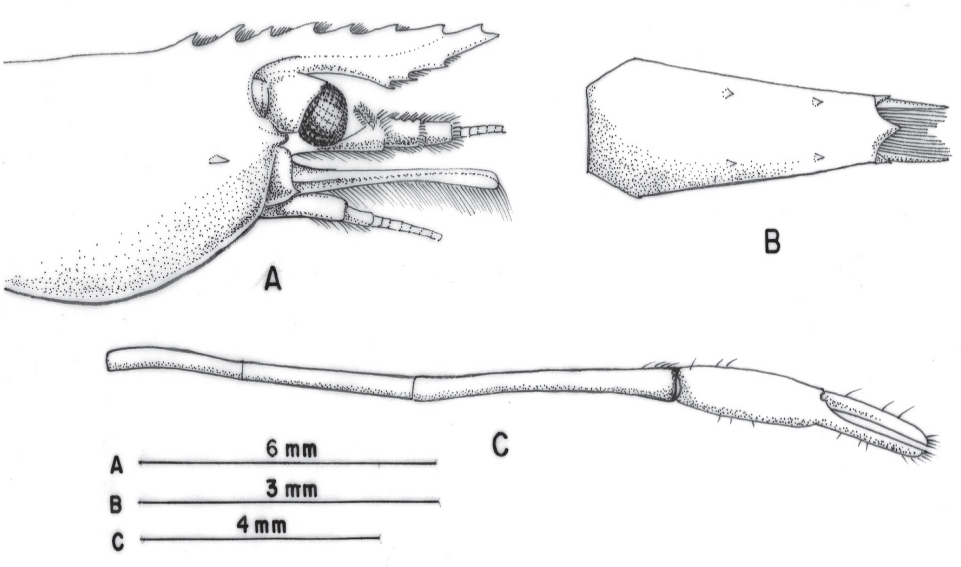


**Figure 9.** *Pseudopalaemon chryseus* Kensley & Walker, 1982, male, ICN-MHN-CR 2554: **A**, anterior part of body, lateral view; **B**, telson, dorsal view; **C**, second pereopod, lateral view.

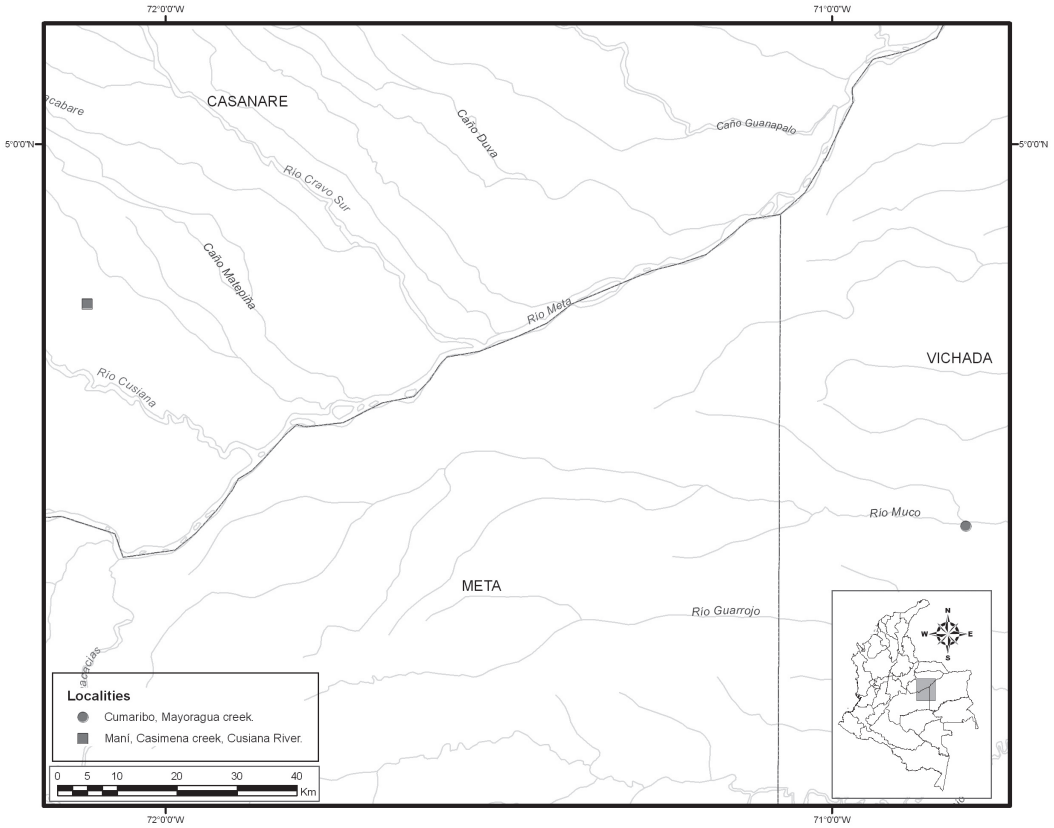


**Figure 10.** Distribution of *Pseudopalaemon chryseus* Kensley & Walker, 1982, in Colombia.

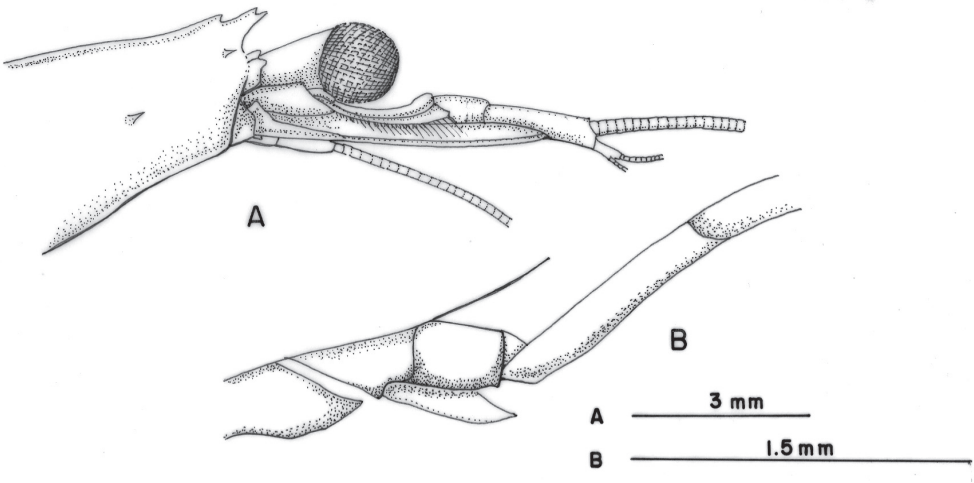


**Figure 11.** *Acetes paraguayensis* Hansen, 1919, male, ICN-MHN-CR 2559: **A**, anterior part of body, lateral view; **B**, proximal part of third pereopod, lateral view.

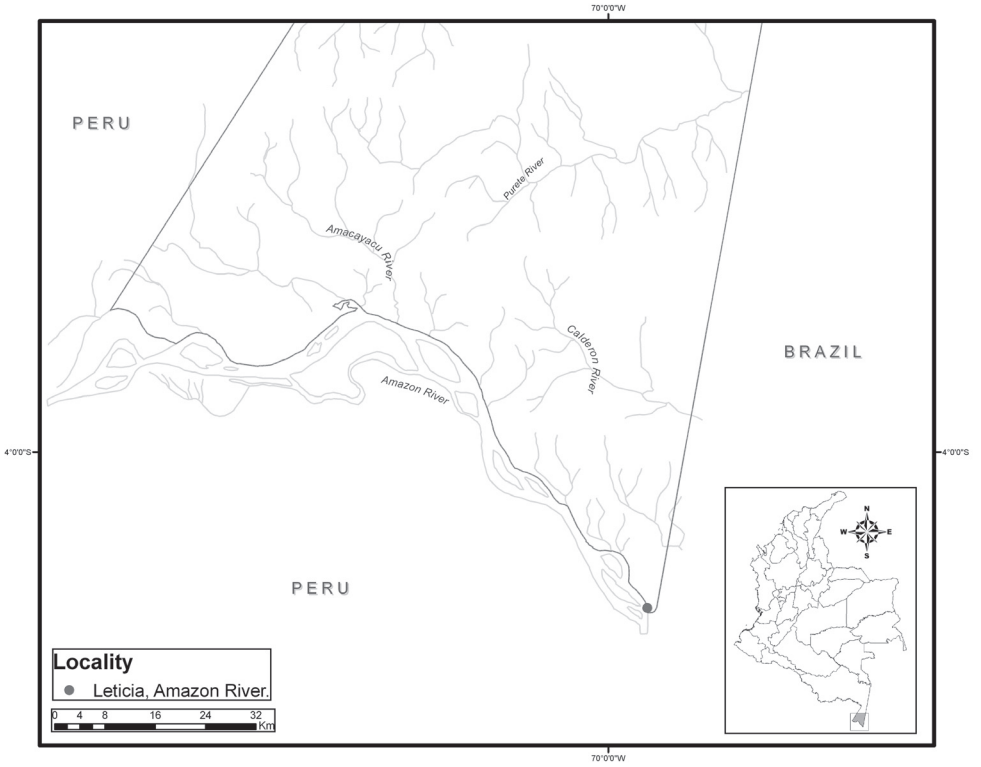


**Figure 12.** Distribution of *Acetes paraguayensis* Hansen, 1919, in Colombia.

**Distribution for Colombia.** The new records including herein, extend its range of distribution to the Amazon River basin (Fig. 12).

**Remarks.** The female specimens reported by García-Dávila & Magalhães, (2004) presented the coxa of the third pair of pereopods rounded and devoided of the spine.

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